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| Notice of Allowability | Application No. | Applicant(s) |
| | 10/660,166 | DAY ET AL. |
| | Examiner Michael D. Pham | Art Unit 2167 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to 6/21/07.
2. The allowed claim(s) is/are 1,3,4,8-11 and 24.
3. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some*
 - c) None of the:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) hereto or 2) to Paper No./Mail Date _____.
 - (b) including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. Notice of References Cited (PTO-892)
2. Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. Notice of Informal Patent Application
6. Interview Summary (PTO-413),
Paper No./Mail Date 20070827.
7. Examiner's Amendment/Comment
8. Examiner's Statement of Reasons for Allowance
9. Other _____.

Detailed Action

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Scott A. Stinebruner (reg. 38,323) on August 30, 2007.

In the claims:

Please replace previous claims 1 and 8 with amended claims 1 and 8 below. Please cancel claims 5-7. And add new claim 24. Accordingly, the claims should be amended as shown below:

1. (Currently Amended) A computer-implemented method for monitoring a query during runtime, said query involving a plurality of join operations, the method comprising the steps of:
wherein the plurality of join operations include a first join that includes a first table and a second table and a second join that includes the first table and a third table;

running the query according to a first join order;

generating a first portion of a result set for the query while running the query according to the first join order, including adding to the result set a first record that matches the plurality of join operations in the query;

concurrent with running the query, collecting performance statistics about each of the join operations;

dynamically changing the first join order, during running of the query, to a second join order based on the statistics; and

where said dynamically changing the first join order, during running of the query,
to a second join order based on the statistics comprises:

determining respective fan-in statistics for the first join and second join;

and

dynamically changing the first join order to the second join order if the
respective fan-in statistics indicate that the second join is more likely to cause fan-
in than the first join; and

generating a second portion of the result set for the query while running the query according to the second join order, including adding to the result set a second record that matches the plurality of join operations in the query such that the result set includes at least the first and second records, the first and second portions of the result set generated for the same execution of the query.

2. (Canceled)
3. (Previously Presented) The method according to claim 1, further comprising the step of:
collecting additional statistics about each of the join operations after the first join order is changed to the second join order.
4. (Original) The method according to claim 3, further comprising the step of:
changing the second join order to either the first join order or a third join order based on the additional statistics.
- 5.-7. (Canceled).
8. (Currently Amended) The method according to claim 1 5, further comprising the steps of:
~~determining respective fan-in statistics for the first join and second join;~~
determining respective fan-out statistics for the first join and the second join; and
dynamically changing the first join order to the second join order based on a combination of the respective fan-in and fan-out statistics.
9. (Previously Presented) The method according to claim 1, comprising the steps of:
identifying a predetermined sample size;
performing the step of collecting statistics for the predetermined sample size;

evaluating the collected statistics; and
dynamically changing the first join order to the second join order based on the collected statistics.

10. (Original) The method according to claim 9, comprising the steps of:
collecting additional statistics for substantially all of the query;
comparing the additional statistics with the collected statistics; and
adjusting the predetermined sample size, for use by a subsequent query, according to results of the comparing step.

11. (Previously Presented) The method according to claim 1, further comprising the steps of:
running another query after the query; and
selecting an initial join order for the other query based on the collected performance statistics.

12. - 23. (Canceled).

24. (New) A computer-implemented method for monitoring a query during runtime, said query involving a plurality of join operations, the method comprising the steps of:
wherein the plurality of join operations include a first join that includes a first table and a second table and a second join that includes the first table and a third table;

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running the query according to a first join order;

generating a first portion of a result set for the query while running the query according to the first join order, including adding to the result set a first record that matches the plurality of join operations in the query;

concurrent with running the query, collecting performance statistics about each of the join operations;

dynamically changing the first join order, during running of the query, to a second join order based on the statistics;

where said dynamically changing the first join order, during running of the query, to a second join order based on the statistics comprises:

determining respective fan-out statistics for the first join and the second join; and

dynamically changing the first join order to the second join order if the respective fan-out statistics indicate that the second join is less likely to cause fan-out than the first join; and

generating a second portion of the result set for the query while running the query according to the second join order, including adding to the result set a second record that matches the plurality of join operations in the query such that the result set includes at least the

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first and second records, the first and second portions of the result set generated for the same execution of the query.

Allowable Subject Matter

3. Claims 1, 3-4, 8-11, and 24 are allowed.

4. The following is an examiner's statement of reasons for allowance: The present application has been thoroughly reviewed. Upon extensive and exhaustive searches of various databases, the examiner respectfully submits that "dynamically changing the first join order, during running of the query, to a second join order based on the statistics;

where dynamically changing the first join order, during running of the query, to a second join order based on the statistics comprises:

determining respective fan-in statistics for the first join and second join;

and

dynamically changing the first join order to the second join order if the respective fan-in statistics indicate that the second join is more likely to cause fan-in than the first join" of claim 1 and similarly,

"dynamically changing the first join order, during running of the query, to a second join order based on the statistics;

where dynamically changing the first join order, during running of the query, to a second join order based on the statistics comprises:

determining respective fan-out statistics for the first join and the second join; and
dynamically changing the first join order to the second join order if the respective
fan-out statistics indicate that the second join is less likely to cause fan-out than the first
join” of claim 24, in combination with all other claimed elements of claim 1 is not taught
by the prior art of record (PTO-892, PTO-1449).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

5. The prior art made of record listed on PTO-892 and not relied, if any, upon is considered pertinent to applicant's disclosure.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael D. Pham whose telephone number is (571)272-3924. The examiner can normally be reached on Monday - Friday 9am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cottingham can be reached on 571-272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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